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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,035	03/27/2001	Toshitsugu Yamamoto	44239-081	7304

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MCDERMOTT, WILL & EMERY
600 13th Street, N.W.
WASHINGTON, DC 20005-3096

EXAMINER

LEE, TOMMY D

ART UNIT PAPER NUMBER

2624

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/817,035	YAMAMOTO, TOSHITSUGU	
	Examiner	Art Unit	
	Thomas D. Lee	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the Correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 16 and 21 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>03272001</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the image processing apparatus of claim 1, "wherein in processing a color image, an image of at least one color obtained by separating an image into each color, is processed by inverting said image *in direction*, applying an error distribution to said image inverted *in direction*, and thereafter again inverting said image having said error distribution applied thereto." (italics added) It is not clear what is meant by the phrase "in direction." Which direction is applicant referring to?

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,708,728 (Nomura).

Regarding claim 1, Nomura discloses an image processing apparatus employing an error distribution process to convert an image represented with multiple values into an image provided in binary representation, comprising: an input block subtracting from data of a target pixel successively input an error from a neighboring pixel (column 2, lines 7-18); a thresholding block thresholding and outputting said data of said target pixel subjected to a subtraction in said input block (column 2, lines 19-28); an error calculation block subtracting from a thresholded value output from said thresholding block a value corresponding to said data of said target pixel having been subjected to said subtraction in said input block and not yet thresholded, to obtain an error (column 2, lines 29-34); and an error operation block multiplying said error obtained in said error calculation block by a distribution weighting coefficient to calculate an error to be distributed to a neighboring pixel before said neighboring pixel is processed (column 2, lines 35-56), wherein said distribution weighting coefficient simply decreases and ultimately reaches zero as a distance from said target pixel increases, and a distance extending to attain zero varies with direction (Fig. 9, note that weights decrease toward zero from target pixel, and extending distance is greater in diagonal directions than in horizontal or vertical directions).

Claim 8 is a method claim corresponding to above-rejected apparatus claim 1. The steps of the method claim are disclosed in Nomura as set forth above.

6. Claims 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,809,177 (Metcalf et al.).

Regarding claim 11, Metcalfe et al. disclose an image processing apparatus employing an error distribution process to convert an image represented with multiple values into an image provided in binary representation, comprising: an input block subtracting from data of a target pixel successively input an error from a neighboring pixel (column 1, lines 26-29); a thresholding block thresholding and outputting said data of said target pixel subjected to a subtraction in said input block (column 1, lines 29-42); an error calculation block subtracting from a thresholded value output from said thresholding block a value corresponding to said data of said target pixel having been subjected to said subtraction in said input block and not yet thresholded, to obtain an error (column 1, lines 34-36 and 40-42); and an error operation block multiplying said error obtained in said error calculation block by a distribution weighting coefficient to calculate an error to be distributed to a neighboring pixel before said neighboring pixel is processed (column 1, lines 43-47), wherein said distribution weighting coefficient introduces into an output image a pattern formed of lines (column 8, lines 40-47; column 12, lines 8-24).

Regarding claim 12, Metcalfe et al. further disclose the error operation block, wherein an image pattern related to an image pattern introduced into an output image that is attributed to said distribution weighting coefficient, is added to said data of said target pixel input or said threshold value (column 11, line 27 – column 12, line 39; note

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that threshold pattern (Table 1) relates to checkerboard pattern 122 of image (Fig. 10), threshold pattern (Table 3) relates to vertical line pattern 121, 123 of image).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura as applied to claims 1 or 8 above, and further in view of Metcalfe et al.

Regarding claim 2, Nomura does not disclose an image processing results in an output image having a first image pattern introduced therein and said thresholding block adds to a threshold value used in said thresholding block a second image pattern related to said first image pattern. This limitation, as mentioned above with respect to claim 12, is disclosed in Metcalfe et al. (column 11, line 27 – column 12, line 39; note that threshold pattern (Table 1) relates to checkerboard pattern 122 of image (Fig. 10), threshold pattern (Table 3) relates to vertical line pattern 121, 123 of image). The introduction of an image pattern as disclosed in Metcalfe et al. enhances error diffused image data by reducing pattern shifting artifacts introduced in the error diffusion process (column 11, lines 13-25). Therefore, it would have been obvious for one of ordinary skill in the art to modify the teaching of Nomura by providing an image pattern in the error diffusion process, as disclosed in Metcalfe et al.

Regarding claims 3, 4 and 9, the vertical image pattern disclosed in Metcalfe et al. (column 12, lines 8-24) is analogous to the vertical line pattern 121, 123 (Fig. 10), and has a predetermined angle (0 degrees) relative thereto (both patterns are vertical lines). As mentioned above, the introduction of an image pattern as disclosed in Metcalfe et al. enhances error diffused image data by reducing pattern shifting artifacts introduced in the error diffusion process (column 11, lines 13-25), and thus it would have been obvious for one of ordinary skill in the art to modify the teaching of Nomura by providing an image pattern in the error diffusion process, as disclosed in Metcalfe et al.

9. Claims 13-15, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura in view of Metcalfe et al.

Claim 13 recites the limitations of above-rejected claim 1, and further recites a threshold operation block adding to a threshold value used in said thresholding block a second image pattern related to a first image pattern introduced into an output image as a result of an image processing provided by said input block, said thresholding block, said error calculation block and said error operation block. As mentioned above, this limitation, while not disclosed in Nomura, is disclosed in Metcalfe et al. (column 11, line 27 – column 12, line 39; note that threshold pattern (Table 1) relates to checkerboard pattern 122 of image (Fig. 10), threshold pattern (Table 3) relates to vertical line pattern 121, 123 of image). Once again, the introduction of an image pattern as disclosed in Metcalfe et al. enhances error diffused image data by reducing pattern shifting artifacts introduced in the error diffusion process (column 11, lines 13-25), and thus it would

have been obvious for one of ordinary skill in the art to modify the teaching of Nomura by providing an image pattern in the error diffusion process, as disclosed in Metcalfe et al. Regarding claims 14 and 15, the vertical image pattern disclosed in Metcalfe et al. (column 12, lines 8-24) is analogous to the vertical line pattern 121, 123 (Fig. 10), and has a predetermined angle (0 degrees) relative thereto (both patterns are vertical lines).

Claims 19 and 20 are method claims corresponding to above-rejected apparatus claims 13 and 15. The steps recited in the method claims are disclosed in Metcalfe et al., as mentioned above.

10. Claims 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura in view of Metcalfe et al. as applied to claims 2 and 13, respectively, above, and further in view of U.S. Patent 6,697,169 (Feng et al.).

Nomura in view of Metcalfe et al. does not suggest said second image pattern varying for each image of a color obtained by separating an image in color. Feng et al. disclose an error diffusion method wherein a correlated noise pattern is added to color separation images, the noise pattern varying for each image (column 5, line 8 – column 6, line 3, Fig. 2). By varying the noise pattern for each image, color clustering is greatly reduced, and mid-tone texturing and worming are destroyed (column 7, lines 20-26). Therefore, it would have been obvious for one of ordinary skill in the art to modify the combined teaching of Nomura and Metcalfe et al. by providing varying image patterns for each color separation, such as disclosed in Feng et al.

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11. Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura as applied to claims 1 and 8, respectively, above, and further in view of U.S. Patent 5,581,371 (Spaulding et al.).

Nomura does not disclose varying said distribution weighting coefficient for each image of a color obtained by separating an image in color. Spaulding et al. disclose an error diffusion method, wherein it is suggested that different error weights be used for each color channel (column 6, lines 10-19). By applying different weights for each color channel, just as in applying varying patterns, helps reduce possible color clustering in the color diffusion process, and thus it would have been obvious for one of ordinary skill in the art to modify the teaching of Nomura by providing different error weights for each color channel, as disclosed in Spaulding et al.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura in view of Metcalfe et al. as applied to claim 13 above, and further in view of Spaulding et al.

Nomura in view of Metcalfe et al. does not disclose varying said distribution weighting coefficient for each image of a color obtained by separating an image in color. As mentioned above with respect to claims 5 and 10, Spaulding et al. disclose an error diffusion method, wherein it is suggested that different error weights be used for each color channel (column 6, lines 10-19). By applying different weights for each color channel, just as in applying varying patterns, helps reduce possible color clustering in the color diffusion process, and thus it would have been obvious for one of ordinary skill

in the art to modify the combined teaching of Nomura and Metcalfe et al. by providing different error weights for each color channel, as disclosed in Spaulding et al.

Allowable Subject Matter

13. Claims 16 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: No prior art has been found to disclose or suggest the step of "wherein in processing a color image, said second image pattern varies in angle for each image of a color obtained by separating an image in color," as recited in claims 16 and 21.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas D. Lee whose telephone number is (703) 305-4870. The examiner can normally be reached on Monday-Friday (7:30-5:00), alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (703) 308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas D. Lee
Primary Examiner
Art Unit 2624

tdl
September 29, 2004